



Ø BEAT

FEBRUARY 1985



COLORADO SPRINGS,
COLORADO

Frank Drake KL7IPV
4964 Harvest Lane
Colorado Springs, CO 80917

FIRST CLASS MAIL



Ø BEAT

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ZERO BEAT is published monthly in the interest of the members of the Pikes Peak Radio Amateur Association Inc., Colorado Springs, Colorado. Permission is given to reprint articles or excerpts provided credit is given. Deadline for submission of articles is the 21st of the month. Classifieds accepted anytime.

The Pikes Peak Radio Amateur Association meets on the second Wednesday of each month at Giuseppe's Depot Restaurant at 10 S. Sierra Madre at 7:30 p.m. All amateurs and interested parties are invited to attend.

Editor: Frank Drake KL7IPV, 4964 Harvest Rd, Colorado Springs, CO 80917 597-2406

COMPUTER CORNER

FROM THE DESK OF YE OLDE EDITOR

Well, this is the last time that you'll see this kind of type in this newsletter. Today, January 31st, the letter quality printer goes out and a new RX-80 Dot Matrix printer comes in. I liked the Smith but found it so slow that I got bored waiting for the file to print. I have to tell you that when you print out ten pages of newsletter, it seems to take forever! The difference in speed is from 12 CPS for the Smith to over 100 CPS for the RX-80. Now that is a BIG difference! I have rerun the program on antenna measurements since I ran out of any new stuff and nothing came in the mail. I had only three returns in the mail for the survey about what you guys are running for computer stuff and software. If you are interested in the responses, ask at the meeting and I'll tell you. It wasn't worth taking up space here. Where are all you computer types? There are no minutes this month due to non arrival of same. Sorry. That is it for this month. See you at the meeting.

73, Frank, KL7IPV

The General meeting this month is at 7:30 P.M. at Giuseppe's Depot on Wednesday, February 13th. The Depot is at 10 S. Sierra St. (behind the Antlers Hotel). The next board meeting is on February 18th at Oak's house at 7:00 P.M. All are welcome to attend.

The board has given approval to Frank, KL7IPV to check out Vans America for the location of our SWAPFEST on March 31st. Oak and I did that and have agreed that is a great place for the SWAPFEST. We can have all the booths we need and even get vehicles inside to show off our mobile rigs. Vans America will even install a couple of rigs in a couple of new vans for display and use. Anyone wish to donate a rig for the weekend for that purpose? It'll be returned soon after. We can also have street vendor carts to cater and let our people enjoy the day without working over a hot stove. More at the meeting.

RAMBLINGS

FROM AROUND THE WORLD OF AMATEUR RADIO

ANTIQUE RADIOS

by Frank Freiler - WB0PAJ

It wasn't until the mid 1920's that complete radios, like the Crosley Model 51 became available to the general public. Corporate contention seemed to hamper the growth of the industry. Designs, innovations, and patents were not generously shared by the early radio manufacturers - huge lawsuits, which tied up production for months were not uncommon in the early days of radio.

Improvements and new inventions came fast in those early pioneer days. Back then, the average person had a better working knowledge of radios than now. Those people who got on at the beginning were able to follow advances in the industry. Any radio receiver was pretty much a do-it-yourself project; anyone interested in radio could read a schematic in those developing days.

The early enthusiast knew if he wanted to hear what was "on the air", he would have to build his own set. Therefore, what he wound up with was a custom-built set. A wealth of information and parts was available in early radio publications. And as radio progressed, complete information and schematics were offered.

In the early 1900's there was little commercial interest in radio despite the development of the two and three element tubes (diodes & triodes).

After WWI there were a number of production portables on the market that came complete with cabinet and tubes (two WD11 tubes). The aerial, ground, as well as the batteries and earphones were connected to terminals in the front panel. The Crosley Model 51 was one such set. The cabinet which measured about 10 inches across contained 1.5 Volt DC tubes and was battery operated. Even at that time only about a quarter of the homes in America were "wired". So the

need for the battery operated sets prevailed through most of the late 1920's and well into the 1930's.

The stock market crash and the great depression of that era had little effect on the evolution of radio. And with the licensing of more and more broadcast stations, the sale of commercially built radios began to grow. The big corporations settled many of their differences. (Some went all the way to the Supreme Court).

1985 ARA HAMFEST & ARRL COLORADO STATE CONVENTION

Sponsored by the Aurora Repeater Association

Sunday, March 17, 1985 8AM - 4PM

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SCHEDULE OF ACTIVITIES

9AM - V.E. TEST SESSION

9AM - ARES/NTS meeting

A.M. ARRL Forum

1PM - 3PM CCARC Meeting

P.M. RMPRA Meeting

For V.E. Test contact Glenn Schultz WØIJJR at 366-9689. A completed 610 form, copy of current license, & a check for \$4 payable to "ARRL-VEC" required. DEADLINE to sign up for tests is February 15, 1985.

PRIZES PRIZES PRIZES PRIZES

Yaesu FT77 H.F. Transceiver

Yaesu 203R 2 Meter H.T.

SWR & Power Meter

Many more prizes & hourly drawings. Winner need not be present to win the GRAND prize.

FOR MORE HAMFEST INFO CONTACT:

Bill Sheffield, KQØJ

1444 Roslyn St., Denver, CO. 80220

(303) 355-2488 or (303) 355-6400

VITA News Release January 17th,
17,1985

"Breakthrough in low cost telecommunications."

Radio amateurs communicate with low orbiting satellite.

Using a tiny satellite now orbiting the earth over the poles at an altitude of 429 miles (690 Km), a team of technical volunteers from the US and Canada yesterday sent letter perfect packet radio messages to England from Hawaii, and received replies. The transmissions represent a breakthrough in the use of low orbit satellites for world wide communications.

Introducing the new concept at the Pacific Telecommunications Council's annual conference in Hawaii, highly trained technical experts from private voluntary agencies in the U.S. and Canada sent messages to the University of Surrey in Guilford, England, where the satellite (Uosat 2) was built. The messages digitized "packet" for info were stored in the satellite's on-board computer. A few hours later, as the satellite passed over Guilford, the letter perfect messages were downloaded and printed out automatically by the Surrey groundstation's small personal computer.

Using amateur radio frequencies inexpensive transmitters and receivers, and personal computers to communicate with a low orbiting bird, the system that will utilize this technology in the future (already known as packet), will offer telecommunications networking at a fraction of the cost of conventional Telexes. Once operational, the PACSAT System will provide organizations throughout the world much needed access to low cost, reliable telecommunications. Groundstation equipment costing not more than \$2000 and capable of operating on batteries or solar power, can be carried in a briefcase. The first full service PACSAT Satellite is scheduled for launch on the shuttle

in early 1987.

Spearheading the development of this technology are VITA [Volunteers In Technical Assistance], a private, voluntary development agency in Washington, DC. that specializes in technology transfer; and AMSAT [Radio Amateur Satellite Corporation], an international association of ham radio operators who also design and build satellites. Interpares, a private Canadian agency, engaged in community based development, supports the effort in Canada. In Washington, PACSAT International applications manager, Dr. Gary Garriott of VITA, said of the contact in space, "I just wish the people co-ordinating the famine relief in Ethiopia had a PACSAT to communicate with. They could use solar energy to power the radio. It would solve a lot of problems in getting help to those remote places."

Relayed to KL7IPV by Malcolm, KE9S; as copied from PACSAT BBS, Arvada.

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Howard W. Sams

TAB BOOKS

MOBILE C.W. OPERATION WITH YAESU'S NEW FT-757-GX

by: Alan Higbie - AL7H

HF mobile operation had always intrigued me. But, it seemed like anything less than a kilowatt into one of those little mobile whip antennas would be woefully inadequate for slugging it out on the HF bands, during the current sunspot minimum. Also, what about the potential noise problems they talk about in the ARRL Handbook; ignition noise, tire static, road static, etc.?

Nevertheless, I decided to look for an HF rig to keep me company on our recent journey from Anchorage, Alaska via California to Colorado Springs. Even if I couldn't work stations I'd at least be able to do some SWL'ing. Our vehicle for the trip was to be a GMC van - so the physical size of the radio wasn't too important. I checked the market and soon discovered that Yaesu had just come out with its FT-757-GX - which in many ways was just like the Kenwood TS-430S; already showing up on the used market. Both had approximately 100 watts output, no tuning, eight frequency memories, dual VFO's, and general coverage receiver. However, the 757 had two additional factors which especially caught my interest: full CW break-in (QSK) and a built-in CW keyer.

I had already decided that if my mobile signals were going to be among the weakest on the mobile band, then CW operations would probably be the best way have completed QSO's. Thus, I would want to use a keyer and the QSK feature would let me hear when my signal was getting clobbered so I could work around the QRM.

The 757 appeared to be the best rig for my needs. I ordered the rig and a Hustler whip antenna with the resonators for 15, 20, 30, 40, and 80 meters. The antenna's ball mount was installed in what I figured would be the best place of all. Ideally, the antenna would perform best if mounted in the middle of the van's roof - high and in the clear - but you would have to climb up on the roof just to switch the resonators with each time you changed bands. You would also have to be careful every time you stopped for gas or went under a bridge. I installed the ball mount about a foot down from the gutter on the left rear corner of the van. This was the highest I could put it and still change resonators while standing on the ground (with a foldover mast). I wanted to keep the antenna the furthest away from anyone who might want to tamper with it while I was parked at a curb. Also, with the antenna mounted on the left rear, it would be visible in my rear view mirror and away from potential engine noise.

The installation went very smoothly. Once you get over the emotional experience of using a hole saw on an otherwise unblemished vehicle - it is quite easy. As my wife commented after first seeing the antenna in place, "You know, I think the van really looks better now with the antenna on it." (I am truly a lucky man!) A length of lightweight, high quality coax was attached and run inside so as to reach all the way to the front. The 757 comes with a 9 foot cable for the DC connection. the cable should be attached directly to the vehicle battery. I found an existing hole in the firewall, connected the cable directly to the battery, plugged the DC into the transceiver which was "temporarily" placed on the dash, hooked up the antenna cable and I was ready to go.

A brief word about where to mount the rig. This actually had been my biggest concern, but I soon found that the rig was so small (3 3/4" X 9 1/2" X 9 1/2") and so light (11 lbs) and had the best little feet that it stayed put either on the dash or on a box next to a rear seat in the van. This was true even while travelling over the bumpy parts of the Alaska Highway. I never did "install" the 757 as such. Sometimes I would operate

CONTINUED ON PAGE 11

LE FOR SALE FOR SALE FOR SALE F
Heath HW-16 CW Xcvr - \$90. National
NC-300 Ham Rec'r - \$80. OFFERS?
TRADES? Steve K0CI 596-6594

" January Fox Hunt News "

by Ken Wyatt - WA6TTY

The January fox hunt took place on Sunday, January 13th, with seven club members participating. Frank, KL7IPV, was the fox this time and the hiding place chosen was the Old Farm Community Center. The hunters were: Don, WD0HWS; John, KA0MWJ; and Maynard, SWL for now; Ken, WA6TTY; Sheila, KA6RVJ and Malcolm, KE9S. The team of Ken and Sheila came in first and with lowest mileage. The prize this month was an ARRL Antenna Handbook. Thanks to all who participated!

For those of you who have not yet joined in the fun, all that is required is a directional antenna (2 or 3 elements), a 2m radio with an S-meter, and a map of the Springs area, a step attenuator is very desirable in order to reduce the signal strength as you get closer to the transmitter. An alternative is to disconnect the antenna cable and go strictly by signal strength when you are very close to the transmitter. I found that a maximum for 50 or 60 db of attenuation was very helpful.

The hunt is held every month on the Sunday following the general club meeting. Meet at the Chapel Hills Mall west side parking lot. The hunt starts at 1:00 PM. We will try to limit the time to one or two hours maximum for the hunt. See you next time. Ken, WA6TTY

(Ed note: next months prize will be a Radio Shack Tape control Center.)

CORRECTION TO ROSTER

Alan Higbie - AL7H
P.O. Box 6100, C.S. 80934
Phone# H-471-0192 W-475-0304

GOODBYE! I know that I have been at this for about a year now, and have heard comments from many of you readers. I wish we could continue but, that is not to be. It has been a rewarding year and I've enjoyed hearing from all of you. In the future, I hope to see more of you but I know that I won't see all of you. It is a shame that it has to end like this, but the choice has been made. GOODBYE! Of course, you can correct that choice if you really want to. All that you have to do is see me and RENEW! Even Les will be happy to take your dues to renew and continue to receive this literary masterpiece. If you don't choose to renew your membership in the PPRAA, then its GOODBYE! You don't get the March issue if you do not renew in February. You have been warned.....GOODBYE! See you next month....if YOU choose.

EW MEMBERS NEW MEMBERS NEW MEMBER
Dennis Yost - No call yet
810 Crystal Park Rd., Manitou Spgs,
80929 Ph# 685-1236

Lonny L. Janes- KAOTRZ
Dalean Janes - KAOTSA
1058 E Jackson C.S. 80907
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SAMS Computer Facts

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As promised here are the monthly listings of DX Contests with a big TINX to the "Round Table" (Nov.) for supplying them...

Editor's note: Here is the handiest list of DX contests held throughout the year we've seen. Contest enthusiasts can use this plan to schedule their weekend activity months or years in advance. Contest-haters can use the list as a dart target. High activity contests are marked with an asterisk. Contests that sometimes offer high activity are marked with an octothorpe. "1st", "2nd", "3rd", etc., refers to the weekends in the month.*

JANUARY

- 1st 40M World SSB Championship
- 2nd 75M World SSB Championship
- 3rd 160M World SSB Championship
- 4th Hungarian "HA" DX Contest
- CQ WW 160M CW Contest
- French CW Contest
- UBA Trophy Contest, CW

FEBRUARY

- 1st YU WW DX Contest
- 2nd RSGB 7 MHz Phone Contest
- 3rd Dutch PACC Contest
- 4th *ARRL Int'l CW DX Contest
- Roman Castles Int'l Contest
- RTTY World Championship
- French Phone Contest
- UBA Trophy Contest, Phone
- CQ WW 160M Phone Contest
- RSGB 7 MHz CW Contest

MARCH

- 1st *ARRL Int'l DX Phone Contest
- 2nd none
- 3rd Bermuda Contest
- 4th *CQ WW WPX Contest, Phone
- BARTG RTTY Contest

APRIL

- 1st SP DX Phone Contest
- 2nd Gagarin Cup Competition *
- 3rd none
- 4th Swiss Helvetia "26" Contest
- "King of Spain" Contest

MAY

- 1st World Telecom CW Contest
- 2nd A. Volta RTTY DX Contest
- 3rd World Telecom SSB Contest
- 4th *USSR CQ-H Contest
- none
- *CQ WW WPX CW Contest

JULY

- 1st Venezuelan WW Phone Contest
- SSTV DX Contest
- IARU Radiosport Championship
- Le Trophée du Tlural Contest
- SEANET CW Contest
- Columbian Independence Contest, CW
- Venezuelan CW Contest

AUGUST

- 1st Romanian "YO" DX Contest
- 2nd European DX CW Contest
- 3rd SEANET Phone Contest
- 4th none
- ALL Asian CW Contest *

SEPTEMBER

- 1st LZ-DX Contest
- 2nd European DX Phone Contest
- 3rd Scandinavian Activity Contest, CW *
- 4th none

OCTOBER

- 1st WSTV Contest
- GARTG SSTV Contest
- UK/ZL/Oceania Phone Contest
- UK/ZL/Oceania CW Contest
- GARTG RTTY Contest
- RSGB 21/28 MHz Phone Contest
- Worked All "Y2" Contest
- RTTY DX Maple Leaf Sweepstakes
- RSGB 21 MHz CW Contest
- WW DX Sprint Contest
- *CQ WW Phone Contest

NOVEMBER

- 1st ARRL Sweepstakes, CW (non-DX)
- 2nd European RTTY Contest
- 3rd "OK" International Contest
- UK vs. The World, QRP
- ARRL Sweepstakes, Phone (non-DX)
- *CQ WW DX CW Contest

DECEMBER

- 1st "EA" DX Phone Contest
- 2nd "HA" DX Contest, CW
- 3rd none
- 4th none

The non-DX contests listed also offer high activity.

THANKS TO 'GRID LEAK' OF PUEBLO RADIO CLUB FOR THIS

The regular meeting of the Pikes Peak Radio Amateur Association was called to order January 9, 1985 at 7:30 p.m. in Giuseppe's Depot. There were 57 members and guests present. After introductions, Les, KC0NC, reported that the treasury had income of \$119.84 and expenses of \$334.22 which gave a current balance of \$1270.96.

Jim, WA9ABB, reported on RFI for KC0QJ. There had been only one recent complaint about a West-side ham. The person was visited and counseled on the effects of using full linear power and the responsibility of hams to use the minimum power to efficiently communicate. The response received was that it was not that persons responsibility if interference is occurring. Thus future interference may occur.

There are now two options for the Swapfest on Palm Sunday. One is the National Guard Armory and the other is the Ford Sinton Rd. Warehouse. The board will have to discuss and make a choice soon.

Doug, WB0MHP, indicated he is waiting for a future meeting with the Hill Climb people. Lots of people will be needed to work this event and schedules should be looked at now and the time of the Hill Climb noted. Doug expects to check propagation paths in May to determine the total number of people that will be needed. He indicated our main duty will be to function as spotters and that we will be about one-tenth of the total number of workers involved. The directors of the event believe we are able to do the job and we need to show that "amateurs" can do professional work.

A fox hunt is being scheduled monthly on the Sunday after the club meeting. Information should be available over the 2-meter bands and at the upcoming meeting in February.

Club members who receive ARRL renewal notices (or those who wish to join the ARRL) can renew through the club and have \$2.00 of their money stay in town. There is no increase in renewal, the club is just allowed to share in the revenue. Contact Les or Mark for more information.

After the break, Ed Means, WØVO, gave another informative, humorous, and interesting talk on the Oscar satellites. He made available several useful handouts and presented a top-notch slide show on the construction of Phase IIIB. Discussion also included the planned launch of Phase IIIC in 1986 and an update on the development of that satellite (which apparently is to be built in Colorado.) Much thanks to Ed for his time and effort in keeping us informed of Amsat happenings.

After the program, the meeting adjourned at 9:45 p.m. The next meeting will be February 13th at Giuseppe's Depot.

Respectfully submitted,
Mark, NØEPF

The regular board meeting of the Pikes Peak Radio Amateur Association was called to order at 7:00 p.m. in the home of Oak Stoeck. Present were Oak, KØROL; Mike, KØTERI; Bob, KØDJ1; Les, KC0NC; Frank, KL7IPV; and Mark, NØEPF.

The agenda was quite relaxed for the meeting as not many items needing immediate attention were brought up. Probably the most important item was the Swapfest. After discussing the need for greater room for this popular event, a motion was made to spend \$450 to rent the Ford Warehouse on Sinton Rd. for the one-day Swapfest on March 30th. The motion passed unanimously. Also, after discussion of the lottery laws in Colorado, it was decided that the "raffle" tickets will have the words "this is an donation" printed on them. Printing of the tickets is currently being looked into.

A letter was received from the Park and Recreation Department about the Senior Olympics; however, it will not be acted upon.

```

10 REM ANTENNA COMP.
20 PRINT CHR$(26)
30 PRINT
40 PRINT*****
50 PRINT*** ANTENNA DIMENSION PROGRAM ***
60 PRINT*****
70 PRINT
80 PRINT
90 PRINT
100 PRINT"TO DETERMINE THE SIZE OF A DIPOLE AND VERTICAL ANTENNA FOR ANY BAND"
110 PRINT"ENTER THE CENTER FREQUENCY IN MEGAHERTZ."
120 INPUT F
130 PRINT
140 PRINT" ",F;"mHz"
150 LET L1=(INT(42900/F))/100
160 LET L2=(INT(15000/F))/100
170 LET L3=(INT(23400/F))/100
180 LET L4=(INT(7130/F))/100
190 LET L5=(INT(102.5*L3))/100
200 LET L6=(INT(102.5*L4))/100
210 LET L7=(INT(L2*50))/100
220 LET L8=(INT(L1*50))/100
230 FOR N = 1 TO 70
240 NEXT N
250 PRINT
260 PRINT CHR$(26)
270 PRINT*****
280 PRINT***** ANTENNA FOR";F;"mHz *****
290 PRINT*****
300 PRINT
310 PRINT
320 PRINT**** HALF-WAVE DIPOLE *****
330 PRINT
340 PRINT"LENGTH", "EACH ARM"
350 PRINT L1;"FEET",L8;"FEET"
360 PRINT L2;"METERS",L7;"METERS"
370 PRINT
380 PRINT**** QUARTER-WAVE VERTICAL *****
390 PRINT
400 PRINT
410 PRINT"VERTICAL", "RADIAL"
420 PRINT L3;"FEET",L5;"FEET"
430 PRINT L4;"METERS",L6;"METERS"
440 PRINT
450 PRINT
460 PRINT
470 PRINT"ENTER Y/N TO CONTINUE"
480 INPUT Y$
490 IF Y$="Y" THEN GOTO 20
500 PRINT" I HOPE YOU ENJOY THE NEW ANTENNA!" "
510 END

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From World Radio News, January, 1985. by Ken Hand, WB2EUF

QRP Transmitter.

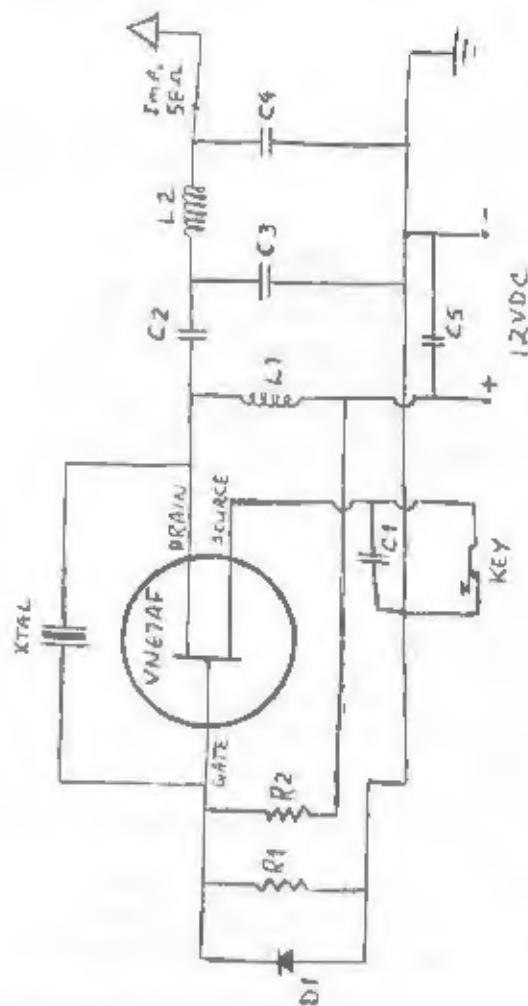
Since building and writing the article about the one-transistor QRP transmitter, I have modified & improved on the design & performance to a large degree, simply by changing the 2N3553 transistor to a VMOS VN67AF Power FET, and the the value of resistance of the gate feedback resistor to 22,000 ohms and by adding a 1N914/1N4148 silicon switching diode in the gate to ground circuit, as can be seen from the circuit diagram of the latest modified Power FET Xmitter. Now there is no more trouble with the danger of destroying the 2N3553 transistor due to mismatch or overload - the Power FET stands up fine against these problems and has a faster and easier keying. The crystal also starts faster, has more power and makes more contacts.

Be sure and make a 1"X 2" heatsink for the Power FET, as it does heat up some. I made a heatsink from a tin sheet metal strip, from a discarded tin can. The tin cansheet metal conducts heat away much better than aluminum. Be careful in bending the prongs of the Power FET. It will fit into the transistor socket OK. Be sure it is put in the socket correctly.

The gate of the Power FET goes to the base pin: drain goes to collector pin of socket: source of the Power FET goes to the emitter pin in the socket. The current drain is higher with the Power FET ~ 1 1/2 amps at 12 VDC, but on CW it would only be 3/4 amp duty cycle because of use of CW mode of operation. However, this modified transmitter works much better in a more reliable manner. []

If it's CW, it's communications.

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- R2 = 22K ohms
- C1 = .33 mfd
- C2 = .1 mfd
- C3 = 420 pF
- C4 = 420 pF
- C5 = .33 mfd
- D1 = 1N914/1N4148
(Radio Shack #276-1122)
- L1 = 10 mH (Radio Shack iron core choke)
- L2 = (Radio Shack modified iron core choke)
- Power FET = VN67AF

while I drove with the rig on the dash or while my wife drove, in which case I would sit in the back seat of the van with the 757 next to me and put my logbook and keyer paddle on a clipboard across my lap. Headphones were used whenever possible so as to not disturb others in the vehicle. Keying while in motion is not exactly error free. There are the bumps and distractions from both inside and outside the van.

The initial QSO was made on 20 meters CW while sitting in my driveway in Anchorage right after I made the connection to the battery. I heard UH8EWW calling CQ. He was only 559, but I thought I'd give it a try. As I started to call, I could hear at least two other stations calling - this is the beauty of the QSK feature - so I let my competition finish calling and then "tailended" with my call. Surprisingly, the UH8 answered the tiny, little 757. He had trouble understanding what the "/M" meant after my call, but eventually we completed the QSO and I felt sure the rig was working.

With this initial DX success, I decided to try for more. It is thrilling enough to work DX stations from home, but to have them come back to a mobile after beating out some competition is pure ecstasy! In just a few months of mobile operation the little transceiver has worked 67 countries on all continents. It hears well and transmits well. Frankly, I've been both astounded and delighted!

CONTINUED NEXT MONTH

Discussion occurred about the current novice classes being held and what the future would hold. Hopefully, better communication between the chairman, committee members and other concerned members will result so that all are informed of what is currently happening with the Education committee. Discussion also was held over the Volunteer Examiner program and the club's role--if any. It was felt this was an area that needs to be dealt with soon and hopefully a statement can be formulated in the coming months.

Upcoming programs were tentatively set as follows: In February the Homebrew winners will make a presentation; in March, we would like to ask Brad, WA5CWZ, to give his presentation from a former G.E. seminar on lightning; and in April, we will try to bring John, WB5AAT, to the meeting for a presentation on the National Traffic System.

Finally, alternate choices of charging advertisers for G-Beat ads was discussed. Ways to simplify the bookkeeping, generate adequate funds for the paper, and possibly save advertisers some money in the long run were looked at. Some consensus was reached but no final decision was made at the time.

Very few bids were received for purchase of the club equipment. However, those that were received met the minimum requirements and several items were sold. The final list was not recorded by the secretary and persons interested in how the equipment was dispersed will need to contact Mike, K6TER.

There being no further business before the board, the meeting was adjourned at 9:10 p.m. The next board meeting will be February 18th at Oakie's.

Respectfully submitted,
Mark, N6EPP

ICE: DEADLINE FOR MARCH ARTICLES IS FEBRUARY 27TH!!!!

Due to late arrival of the minutes, they are published in spite of what the COMPUTER CORNER said.

MILEY'S RADIO

Jess KOTAA 719 W. 7th St. Florence, Colorado 81226 784-3040
 Hours 8 to 6 Tuesday through Friday — Saturdays 8 to 12 — Evening Hours 7:30 to 9 (Call Ahead)
 Closed March 16 for Aurora Hamfest/Colorado Council

NEW EQUIPMENT IN STOCK

Kenwood TS 9305 Sale \$1380 w/auto tuner \$1545.
 Kenwood TS 4305 w/free FM unit \$695.
 PS 430 Power Supply \$134.
 Kenwood AT250 auto antenna tuner for 4305 \$290.
 Kenwood TS 8305 \$779.
 Icom 730 \$599.
 Icom 745 \$765.
 Yaesu FT 757GX \$760.
 New "Amp Supply" LA 1000NT 160-15 meter 1200W PEP-B800 DC
 QSK, no tune up, drives with 100W-list \$529 - SALE \$475.
 Kenwood 4000A 2m & 440 FM Xcvr List \$699 - Sale \$525.
 Same as above w/ voice synthesizer \$560.
 Kenwood TR-7950 45W List \$459 - Sale \$359.
 Kenwood 7930 \$314.
 Kenwood TR 2600A New HT \$298.
 New Kenwood TH23AT shirtpocket 2 mtr. HT-1w & low power \$198.
 Kenwood TR 3500 440 MHz HT-2 only \$265.
 Santeec 142 2M HT w/STB BC desk chgr. \$259.
 New Santeec LS 202A 2 mtr HT FM/LISB/LSB/S/2.5 watts \$239.
 Santeec 442 uP 440 HT \$279.
 Complete line of Tokyo High Power amps & tuners at lowest prices.
 Specical—Tokyo HI Power HC 2000 2 KW tuner/watts/swr 160-10 meters
 with everything List \$399 Sale \$275.
 Icom 2AT HT Reg. \$269 Now \$189.
 Icom 02AT \$298.
 Icom 4AT \$229.
 Icom D4AT \$325.
 Icom 27A \$314/Icom 27H \$364.
 Voco mini Power Packer for IC 2AT-chgr/amp \$150.
 Mirage Amps - Low Prices
 Azden PCS 4000 \$269.
 New KDK 2033 mini 25W w/TTM & LCD display-3 only \$249.
 New Yaesu FT 209RH 5 watt FM HT \$298.
 Astron PS - ALL AMPS - Low Prices
 Welz test meters in stock
 Kantronics interface for VIC 20 and others \$125.
 Kantronics Hamsoft for VIC 20 \$46.
 Kantronics Hamtext for VIC/Com 64 \$90.
 Kantronics Interface II - \$239.
 MFJ wet & dry dummy loads — in stock
 MFJ Tuners and Keyers — in stock
 New MFJ 1224 interface in stock w/free soft program \$90.
 BMC 12" green monitor \$79.
 HYTEC EV 2114 14" color monitor for C64 - switches from color to
 green or blue \$199.
 Commodore 1702 color monitor \$199.
 Commodore 1541 Disk Drive \$159.
 Commodore MPS 801 printer \$175.
 Combo - C64, 1541 disk drive \$360.
 Commodore 64 \$169.

USED EQUIPMENT

Kenwood TR 2400 like new \$165. w/spk! mike \$180.
 Kenwood TR 2500 \$175.
 Kenwood ST 1 desk charger \$40.
 Kenwood 2400 mobile charger/supply \$25.
 Wilson 1402SM crystal 2 meter HT \$75.
 Wilson Mk. 4 - exc. cond - TTP \$95.
 Icom 2AT \$135.
 Icom BC 30 desk charger \$45.
 Yaesu FT 208R \$175.
 Yaesu 2C 8A desk chgr/ps for 208R \$65.
 Swan SS 200A/160 solid state 200W 80-10 mtr. xcvr. w/p.s. & spkr. \$295.
 Heath Shawnee 6 meter AM w/AC & DC adapters \$35.
 Yaesu FT 101E mint \$395.
 Yaesu FT 101B \$350.
 Kenwood TS 180S digital \$350.
 Kenwood PS 30 power supply \$95.
 Kenwood TS 520 w/digital RØ - mint cond \$475. w/o digital \$395.
 Kenwood AT 200 tuner \$90.
 Icom R70 gen. cov. rxvr. w/FL44/A. SSB filter (cost \$145) like new \$550.
 Tempo 2020 ext. VFO \$75.
 Hal CT 2200 and keyboard-like new \$450.
 National NCX3 200W 80-40-20 w/p.s. & spkr. nice cond. \$225.
 Galaxy 5 w/ AC supply and speaker \$195.
 Galaxy DC1000 mobile power supply \$25.
 Drake TR 4 w/p.s. & digital \$355.
 Drake TR 4 w/p.s. \$325.
 Drake TR 4 w/mobile supply only \$295.
 Mini Products HQ-1 6-20 mtr. mini quad-up 2 weeks, covenant victim \$125.
 RCA volt-ohmst w/probes-call Wes KROK on 1979.

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Membership Application PIKES PEAK RADIO AMATEUR ASSOCIATION

Name _____

Address _____

City _____ State _____ Zip _____

Call _____ License Class _____

Are You An ARRL Member? Yes No Telephone _____

Full Member \$12.00

Family Membership \$15.00

Additional Names _____ Calls _____

Associate Member \$8.00 (Outside Teller & El Paso Counties.)